

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica St. Louis 13715 Rider Trail North Earth City, MO 63045 Tel: (314)298-8566

TestAmerica Job ID: 160-6492-1

Client Project/Site: Beta Chem site, Lenexa, KS

For:

Tetra Tech EM Inc. 415 Oak Street Kansas City, Missouri 64106

Attn: Danny O'Connor

Authorized for release by: 5/8/2014 11:47:54 AM

Erika Gish, Project Manager II (314)298-8566

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..... Links

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page	1
Table of Contents	2
Chain of Custody	3
Receipt Checklists	
Definitions/Glossary	5
Method Summary	6
Sample Summary	7
Detection Summary	8
Client Sample Results	9
QC Sample Results	11
QC Association Summary	12

CHAIN-OF-CUSTODY RECORD



TETRA TECH EM INC. 8030 Flint Street Lenexa, Kansas 66214 (913) 894-2600

Date:	5/5/14			
Page:	<i>i</i>	of		 -
Project N	o: <u>X9025</u>	14006	ρ.	
Shipment	: Method:	Fed 6	χ	
Number o	of Coolers Shi	pped:	,	-

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Project Name: Beta - Cher	· ·		L	₹×n		alyse	es (F	res	erva	tive	<u>;) </u>	,			Turn-around Time
Project Manager: Danny O	'Connor		14 819	Lound Scinh Hahor							\$		1	Containers	Requested: 48-hour
Sampler: (Signature)			Carbon-14 ria	Sound Sc.							0	>	Matrix Type	7	
Sample Number:	Date:	Time:	63	3									Mat	Š	Laboratory Comments:
GZ PVC Intake	5-5-14	1230	×										WP	ı	
GI Hood Frame	5-5-14	1235	1			Ŀ	, 9							1	
G1 Hydrogen Cylinder	5-5-14	1240				Č		6							
GI Argon Cylinder	5-5-14	1245						<u>r</u>			<u> </u>				
Container 20	5-5-14	1250			?\\\	>									
Container 7R	5-5-14	1255							·						
Container 19	5-5-14	1300		2											
Container 16	5-5-14	1305	V										V		
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Matrix: S = Soil M = Sediment W = Water A = Air WP = Wipe Preservatives: 1 = Ice 2 = HCl $3 = H_2SO_4$ 4 = NaOH $5 = HNO_3$

/ X // * .	Received By: (Signature) All Clark	Date:	Time:
		5.6.14	0100
Relinquished By:	Received By:	Date:	Time:
(Signature)	(Signature)		
Relinquished By:	Received By:	Date:	Time:
(Signature)	(Signature)		

Job Number: 160-6492-1

Client: Tetra Tech EM Inc.

List Source: TestAmerica St. Louis

Login Number: 6492 List Number: 1 Creator: Clarke, Jill C

Creator: Clarke, Jill C	
Question	Answer Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td>	True
The cooler's custody seal, if present, is intact.	True
Sample custody seals, if present, are intact.	N/A
The cooler or samples do not appear to have been compromised or tampered with.	True
Samples were received on ice.	N/A
Cooler Temperature is acceptable.	True V
Cooler Temperature is recorded.	True
COC is present.	True
COC is filled out in ink and legible.	True
COC is filled out with all pertinent information.	True
Is the Field Sampler's name present on COC?	N/A
There are no discrepancies between the containers received and the COC.	True
Samples are received within Holding Time.	True
Sample containers have legible labels.	True
Containers are not broken or leaking.	True
Sample collection date/times are provided.	True
Appropriate sample containers are used.	True
Sample bottles are completely filled.	True
Sample Preservation Verified.	True
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A
Multiphasic samples are not present.	True
Samples do not require splitting or compositing.	True
Residual Chlorine Checked.	N/A

Definitions/Glossary

Client: Tetra Tech EM Inc.

TestAmerica Job ID: 160-6492-1 Project/Site: Beta Chem site, Lenexa, KS

Qualifiers

Rad

RPD

TEF

TEQ

Qualifier	Qualifier Description
G	The Sample MDC is greater than the requested RL.
U	Result is less than the sample detection limit.

Glossarv

Glossary	
Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)

Relative Percent Difference, a measure of the relative difference between two points

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

TestAmerica St. Louis

Method Summary

Client: Tetra Tech EM Inc.

Project/Site: Beta Chem site, Lenexa, KS

TestAmerica Job ID: 160-6492-1

Method	Method Description	Protocol	Laboratory
C-01-1	Carbon-14 (EERF C-01-1)	EERF	TAL SL

Protocol References:

EERF = EERF

Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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Sample Summary

Client: Tetra Tech EM Inc.

Project/Site: Beta Chem site, Lenexa, KS

TestAmerica Job ID: 160-6492-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-6492-1	G2 PVC INTAKE	Filter	05/05/14 12:30	05/06/14 07:00
160-6492-2	G1 HOOD FRAME	Filter	05/05/14 12:35	05/06/14 07:00
160-6492-3	G1 HYDROGEN CYLINDER	Filter	05/05/14 12:40	05/06/14 07:00
160-6492-4	G1 ARGON CYLINDER	Filter	05/05/14 12:45	05/06/14 07:00
160-6492-5	CONTAINER 20	Filter	05/05/14 12:50	05/06/14 07:00
160-6492-6	CONTAINER 7R	Filter	05/05/14 12:55	05/06/14 07:00
160-6492-7	CONTAINER 19	Filter	05/05/14 13:00	05/06/14 07:00
160-6492-8	CONTAINER 16	Filter	05/05/14 13:05	05/06/14 07:00

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Detection Summary

Client: Tetra Tech EM Inc. TestAmerica Job ID: 160-6492-1 Project/Site: Beta Chem site, Lenexa, KS Client Sample ID: G2 PVC INTAKE Lab Sample ID: 160-6492-1 No Detections. Client Sample ID: G1 HOOD FRAME Lab Sample ID: 160-6492-2 No Detections. Client Sample ID: G1 HYDROGEN CYLINDER Lab Sample ID: 160-6492-3 No Detections. Lab Sample ID: 160-6492-4 Client Sample ID: G1 ARGON CYLINDER No Detections. **Client Sample ID: CONTAINER 20** Lab Sample ID: 160-6492-5 No Detections. **Client Sample ID: CONTAINER 7R** Lab Sample ID: 160-6492-6 No Detections. **Client Sample ID: CONTAINER 19** Lab Sample ID: 160-6492-7 No Detections. Client Sample ID: CONTAINER 16 Lab Sample ID: 160-6492-8 No Detections.

Client: Tetra Tech EM Inc.

Project/Site: Beta Chem site, Lenexa, KS

Client Sample ID: G2 PVC INTAKE

Date Collected: 05/05/14 12:30

Date Received: 05/06/14 07:00

Lab Sample ID: 160-6492-1

Matrix: Filter

TestAmerica Job ID: 160-6492-1

Method: C-01-1 - Carbon-14 (EERF C-01-1)

Count Total Uncert. Uncert. $(2\sigma + / -)$ $(2\sigma + / -)$

Analyte Result Qualifier RL MDC Unit Prepared Carbon-14 9900 G 148 1080 5.00

7.16 pCi/Sample 05/06/14 14:11

Analyzed 05/07/14 16:01

Dil Fac

Client Sample ID: G1 HOOD FRAME

Date Collected: 05/05/14 12:35 Date Received: 05/06/14 07:00

Lab Sample ID: 160-6492-2

Matrix: Filter

Method: C-01-1 - Carbon-14 (EERF C-01-1)

Count Total Uncert. Uncert. $(2\sigma + / -)$ $(2\sigma + / -)$

50.9

370

MDC Unit 3.92 pCi/Sample

Prepared 05/06/14 14:11

Analyzed 05/07/14 16:04

Lab Sample ID: 160-6492-3

Dil Fac

Client Sample ID: G1 HYDROGEN CYLINDER

Result Qualifier

3400

Date Collected: 05/05/14 12:40

Date Received: 05/06/14 07:00

Analyte

Carbon-14

Method: C-01-1 - Carbon-14 (EERF C-01-1)

Count Total Uncert.

12.8

Result Qualifier Analyte Carbon-14 846

Uncert. (2σ+/-) $(2\sigma + / -)$

92.2

RL

5.00

RL

5.00

5.00

RL

5.00

MDC Unit 1.95 pCi/Sample

Prepared 05/06/14 14:11

Analyzed 05/07/14 16:10

Dil Fac

Matrix: Filter

Client Sample ID: G1 ARGON CYLINDER

Date Collected: 05/05/14 12:45

Date Received: 05/06/14 07:00

Lab Sample ID: 160-6492-4

Matrix: Filter

Method: C-01-1 - Carbon-14 (EERF C-01-1)

Count Total Uncert. Uncert. Analyte Result Qualifier $(2\sigma + / -)$ $(2\sigma + / -)$ 32.9

4.63 Carbon-14 301

265

RL

MDC Unit 1.27 pCi/Sample

Prepared 05/06/14 14:11

Analyzed 05/07/14 16:26

Dil Fac

Client Sample ID: CONTAINER 20

Date Collected: 05/05/14 12:50 Date Received: 05/06/14 07:00

Analyte

Carbon-14

Lab Sample ID: 160-6492-5

Matrix: Filter

Method: C-01-1 - Carbon-14 (EERF C-01-1)

Total Count Uncert. Uncert.

 $(2\sigma + / -)$ $(2\sigma + / -)$ Result Qualifier 4.09 29.0 MDC Unit 1.26 pCi/Sample

Prepared 05/06/14 14:11

Analyzed 05/07/14 17:06

Dil Fac

Client Sample Results

Client: Tetra Tech EM Inc.

Project/Site: Beta Chem site, Lenexa, KS

Client Sample ID: CONTAINER 7R

Date Collected: 05/05/14 12:55 Date Received: 05/06/14 07:00

Lab Sample ID: 160-6492-6

TestAmerica Job ID: 160-6492-1

Matrix: Filter

Method: C-01-1 - Carbon-14 (EERF C-01-1)

Count	Total
Uncert.	Uncert.
(2σ+/-)	(2g+/-)

MDC Unit Dil Fac Analyte Result Qualifier RL Prepared Analyzed 05/06/14 14:11 Carbon-14 209 3.26 22.8 5.00 1.13 pCi/Sample 05/07/14 17:53

Client Sample ID: CONTAINER 19

Date Collected: 05/05/14 13:00 Date Received: 05/06/14 07:00

Lab Sample ID: 160-6492-7

Matrix: Filter

Method: C-01-1 - Carbon-14 (EERF C-01-1)

Count	Total
Uncert.	Uncert.
(2σ+/-)	(2σ+/-)

1.35 4.05 1.07 pCi/Sample

Prepared 05/06/14 14:11

Analyzed 05/07/14 18:50

Lab Sample ID: 160-6492-8

Dil Fac

Client Sample ID: CONTAINER 16

Date Collected: 05/05/14 13:05 Date Received: 05/06/14 07:00

Analyte

Carbon-14

Count

Uncert.

Result Qualifier (2σ+/-) 1.07

Result Qualifier

35.3

Analyte Carbon-14 18.6

Method: C-01-1 - Carbon-14 (EERF C-01-1)

Total

Uncert.

(2σ+/-)

RL 2.28 5.00

RL

5.00

MDC Unit 1.06 pCi/Sample

Prepared 05/06/14 14:35

Analyzed 05/07/14 19:58

Dil Fac

Matrix: Filter

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech EM Inc.

Project/Site: Beta Chem site, Lenexa, KS

TestAmerica Job ID: 160-6492-1

Method: C-01-1 - Carbon-14 (EERF C-01-1)

Lab Sample ID: MB 160-120490/1-A

Matrix: Filter

Analysis Batch: 120894

Client Sample ID: Method Blank Prep Type: Total/NA

Prep Batch: 120490

мв мв Uncert. Uncert. Analyte Result Qualifier (2σ+/-) (2σ+/-) MDC Unit Prepared Analyzed Dil Fac Carbon-14 -2.225 U 0.585 0.632 5.00 1.08 pCi/Sample 05/06/14 14:11 05/07/14 13:45

Total

Count

LCS LCS

Result Qual

19.32

Spike

Added

21.1

Lab Sample ID: LCS 160-120490/2-A

Matrix: Filter

Analyte

Carbon-14

Analysis Batch: 120894

Client Sample ID: Lab Control Sample Prep Type: Total/NA

Prep Batch: 120490

Total Uncert. (2σ+/-)

2.35

RL MDC Unit 5.00 1.04 pCi/Samp %Rec 92

%Rec. Limits 67 - 124

TestAmerica St. Louis

QC Association Summary

Client: Tetra Tech EM Inc.

TestAmerica Job ID: 160-6492-1

Project/Site: Beta Chem site, Lenexa, KS

Rad

Prep Batch: 120490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-6492-1	G2 PVC INTAKE	Total/NA	Filter	LSC_Dist_Susp	
160-6492-2	G1 HOOD FRAME	Total/NA	Filter	LSC_Dist_Susp	
160-6492-3	G1 HYDROGEN CYLINDER	Total/NA	Filter	LSC_Dist_Susp	
160-6492-4	G1 ARGON CYLINDER	Total/NA	Filter	LSC_Dist_Susp	
160-6492-5	CONTAINER 20	Total/NA	Filter	LSC_Dist_Susp	
160-6492-6	CONTAINER 7R	Total/NA	Filter	LSC_Dist_Susp	
160-6492-7	CONTAINER 19	Total/NA	Filter //	LSC_Dist_Susp	
160-6492-8	CONTAINER 16	Total/NA	Filter	LSC_Dist_Susp	
LCS 160-120490/2-A	Lab Control Sample	Total/NA	Filter	LSC_Dist_Susp	
MB 160-120490/1-A	Method Blank	Total/NA	Filter	LSC_Dist_Susp	



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